# NEUROPHARMACOLOGY

List of Contents, Author and Subject Index

**Volume 32, 1993**

PERGAMON PRESS OXFORD — NEW YORK — SEOUL — TOKYO

# NEUROPHARMACOLOGY



*Chief Editor*

GRAHAM L. COLLINGRIDGE

*Editorial Assistant*

ELIZABETH J. COAN

Cellular and Molecular Neuroscience Group
The Medical School
The University of Birmingham
Edgbaston
Birmingham B15 2TT, U.K.

*Executive Editorial Board*

JOËL G. BOCKAERT, Montpellier
STEVEN J. COOPER, Birmingham
RAYMOND J. DINGLEDINE, Atlanta
JOHN GARTHWAITE, Beckenham
A. RICHARD GREEN, London
DAVID LODGE, London
IAN L. MARTIN, Edmonton
RICHARD J. MILLER, Chicago
MASAYOSHI MISHINA, Niigata
PETER H. SEEBURG, Heidelberg
MICHAEL A. SIMMONDS, London

*Editors Emeriti*

PHILIP B. BRADLEY, Birmingham
ERMINIO COSTA, Washington, D.C.

*Advisory Editorial Board*

SIMON ALFORD, Chicago
PHILIPPE ASCHER, Paris
BRIAN AULT, Collegeville
NICHOLAS M. BARNES, Birmingham
BRUCE P. BEAN, Boston
TIM BLISS, London
NORMAN G. BOWERY, London
GODFREY G. S. COLLINS, Sheffield
ALAN J. CROSS, London
COLIN T. DOURISH, Maidenhead
ANDREW DRAY, London
RICHARD H. EVANS, Bristol
BERTIL B. I. FREDHOLM, Stockholm
ANN G. HAYES, Ware
P. MAX HEADLEY, Bristol
DAVID J. HEAL, Nottingham
GRAEME HENDERSON, Bristol
RAY G. HILL, Harlow
TAGE HONORÉ, Málov
SUSAN D. IVERSEN, Oxford
DAVID J. JULIUS, San Francisco
ARTHUR KONNERTH, Homburg
JEREMY J. LAMBERT, Dundee
ROBIN A. J. LESTER, Houston
HILARY J. LITTLE, Bristol
ROBERT L. MACDONALD, Ann Arbor
ROBERT C. MALENKA, San Francisco
CHARLES A. MARSDEN, Nottingham
MARK L. MAYER, Bethesda
JAMES O. MCNAMARA, Durham
BRIAN S. MELDRUM, London
RICHARD G. M. MORRIS, Edinburgh
DAVID B. MORTON, Birmingham
STEFAN R. NAHORSKI, Leicester
SHIGETADA NAKANISHI, Kyoto
GIUSEPPE NISTICÒ, Rome
STEVEN M. PAUL, Indianapolis
TERRY D. REISINE, Philadelphia
KLAUS G. REYMANN, Magdeburg
JOHN RODGERS, Leeds
MICHAEL A. ROGAWSKI, Bethesda
NANCY J. ROTHWELL, Manchester
TREVOR G. SMART, London
DAVID N. STEPHENS, Berlin
IAN P. STOLERMAN, London
RICHARD W. TSIEN, Stanford
JOHN L. WADDINGTON, Dublin
JEFFREY C. WATKINS, Bristol
MICHAEL M. WHITE, Philadelphia
ADRIAN C. WILLIAMS, Birmingham



*Publishing Office*

Pergamon Press Ltd, Pergamon House, Bampfylde Street, Exeter EX1 2AH, England (*Tel.* Exeter (0392) 51558; *Fax* (0392) 425370). *Production Editor:* Linda Smith.

*Subscription and Advertising Offices*

*North America*—Pergamon Press Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, U.S.A. *Rest of the World*—Pergamon Press Ltd, Headington Hill Hall, Oxford OX3 0BW, England (*Tel.* Oxford (0865) 794141)

*Subscription Rates*

Annual Institutional Subscription Rates 1994: North, Central and South America, US$1200; Rest of World, £779. Associated Personal Subscription Rates are available on request for those whose institutions are library subscribers. Sterling prices exclude VAT. Non-VAT registered customers in the European Community will be charged the appropriate VAT in addition to the price listed. Prices include postage and insurance and are subject to change without notice.

*Back Issues*

Back issues of all previously published volumes, in both hard copy and on microform are available direct from Pergamon Press offices.



Published monthly. Copyright © 1993 Pergamon Press Ltd



Second class postage paid at RAHWAY NJ. Postmaster send address corrections to *Neuropharmacology*, Pergamon Press Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, U.S.A.


*Cover*—In the foreground, a molecular model of Conotoxin MVIIA from Quanta 3.2 by Dr Trevor Howe (Eli Lilly), coloured on individual atomic charge using CHARMm 22. In the background from Dr A. Fox's laboratory (University of Chicago) are single channel calcium currents from an adrenal medullary cell in control conditions on the left, and in the presence of BayK8644 on the right.

# CONTENTS OF VOLUME 32

## NUMBER 1


*A brief history of the journal* iii

*Editorial* v

**Zuner A. Bortolotto and Graham L. Collingridge** — Characterisation of LTP induced by the activation of glutamate metabotropic receptors in area CA1 of the hippocampus 1

**Andrew M. Batchelor and John Garthwaite** — Novel synaptic potentials in cerebellar Purkinje cells: probable mediation by metabotropic glutamate receptors 11

**Krystyna Kolasa and R. S. Jope** — Synergistic activation of phosphoinositide hydrolysis induced in brain slices by norepinephrine and the excitatory amino acid agonist, *trans*-ACPD 21

**Philippe Marin, Jean-François Quignard, Mireille Lafon-Cazal and Joël Bockaert** — Non-classical glutamate receptors, blocked by both NMDA and non-NMDA antagonists, stimulate nitric oxide production in neurons 29

**Jeremy M. Henley, Robert Jenkins and Stephen P. Hunt** — Localisation of glutamate receptor binding sites and mRNAs to the dorsal horn of the rat spinal cord 37

**G. B. De Sarro, G. Bagetta, C. Spagnolo and G. Nisticò** — Antagonists of *N*-methyl-D-aspartate receptors block seizures induced by putrescine in the deep prepiriform cortex 43

**G. B. De Sarro and A. De Sarro** — Anticonvulsant properties of non-competitive antagonists of the *N*-methyl-D-aspartate receptor in genetically epilepsy-prone rats: comparison with CPPene 51

**R. J. Prince and M. A. Simmonds** — Differential antagonism by epipregnanolone of alphaxalone and pregnanolone potentiation of [$^3$H]flunitrazepam binding suggests more than one class of binding site for steroids at $GABA_A$ receptors 59

**R. Camsonne, Louisa Barre, Marie-Christine Petit-Taboué, J. M. Travère, R. Jones, Danièle Debruyne, M. A. Moulin, E. T. MacKenzie and J. C. Baron** — Positron emission tomographic studies of [$^{11}$C]MDL 72222, a potential 5-$HT_3$ receptor radioligand: distribution, kinetics and binding in the brain of the baboon 65

**D. I. Wallis, J. Wu and X. Wang** — Descending inhibition in the neonate rat spinal cord is mediated by 5-hydroxytryptamine 73

**H.-Y. Wang, L.-W. Zhou, E. Friedman and B. Weiss** — Differential regulation of release of acetylcholine in the striatum in mice following continuous exposure to selective $D_1$ and $D_2$ dopaminergic agonists 85

**B. Gao and M. G. Cutler** — Effects of quinpirole on the behaviour shown by mice in the light–dark box and during social interactions 93

*Rapid Communications*

**Steven J. Cooper, John Francis and David J. Barber** — Selective dopamine D-1 receptor agonists, SK&F 38393 and CY 208-243 reduce sucrose sham-feeding in the rat 101

**Thoralf Opitz and Klaus G. Reymann** — (1S, 3R)-ACPD protects synaptic transmission from hypoxia in hippocampal slices 103


## NUMBER 2


**P. J. Forshaw, T. Lister and D. E. Ray** — Inhibition of a neuronal voltage-dependent chloride channel by the type II pyrethroid, deltamethrin 105

| | | |
|---|---|---|
| **J. Yanai, Y. Rogel-Fuchs, C. G. Pick, T. Slotkin, F. J. Seidler, E. A. Zahalka and M. E. Newman** | Septohippocampal cholinergic changes after destruction of the A10-septal dopaminergic pathways | 113 |
| **H. Hartmann, S. A. Cohen and W. E. Müller** | Effects of subchronic administration of pyritinol on receptor deficits and phosphatidylinositol metabolism in the brain of the aged mouse | 119 |
| **M. Yasui, K. Kawasaki, A. Matsushita and M. Satoh** | Benzodiazepine inverse agonists augment long-term potentiation in CA1 and CA3 of guinea pig hippocampal slices | 127 |
| **H.-Y. Huang** | $\omega$-Conotoxin GVIA inhibits release of noradrenaline from rat hippocampal slices in the absence of extracellular calcium | 133 |
| **T. S. Rao, N. M. Gray, M. S. Dappen, J. A. Cler, S. J. Mick, M. R. Emmett, S. Iyengar, J. B. Monahan, A. A. Cordi and P. L. Wood** | Indole-2-carboxylates, novel antagonists of the *N*-methyl-D-aspartate (NMDA)-associated glycine recognition sites: *in vivo* characterization | 139 |
| **C. G. Boissard and V. K. Gribkoff** | The effects of the adenosine reuptake inhibitor soluflazine on synaptic potentials and population hypoxic depolarizations in area CA1 of rat hippocampus *in vitro* | 149 |
| **G. S. Dhaunsi, B. Singh, A. K. Singh, D. A. Kirschner and I. Singh** | Thioridazine induces lipid peroxidation in myelin of rat brain | 157 |
| **E. Ghansah, P. Kopsombut, M. A. Maleque and A. Brossi** | Effects of mescaline and some of its analogs on cholinergic neuromuscular transmission | 169 |
| **K. Shibata, M. Sakimura and T. Furukawa** | Antagonism of central pressor response to angiotensin II by $\alpha$-human atrial natriuretic polypeptide at the preoptic area and posterior hypothalamus in rats | 175 |
| **A. Ally, Y. Hara and S. Murayama** | Cardiovascular effects of central administration of cholinomimetics in anesthetized cats | 185 |
| **D. D. Wheeler, A. M. Edwards and J. G. Ondo** | The effect of cocaine on membrane potential, on membrane depolarization by veratridine or elevated $[K]_o$ and on sodium/potassium permeability ratios in synaptosomes from the limbic cortex of the rat | 195 |


## NUMBER 3


| | | |
|---|---|---|
| **Lynn O. Wilkinson, Lynda M. Hawkins, Margaret S. Beer, Marcel F. Hibert and Derek N. Middlemiss** | Stereoselective actions of the isomers of metitepine at 5-$HT_{1D}$ receptors in the guinea pig brain | 205 |
| **Michael R. Pranzatelli, Prayus T. Tailor and Parisa Razi** | Brainstem serotonin receptors in the guinea pig: implications for myoclonus | 209 |
| **Sandra E. File, H. Zangrossi Jr and N. Andrews** | Social interaction and elevated plus-maze tests: changes in release and uptake of 5-HT and GABA | 217 |
| **Isabel Jiménez and J. A. Fuentes** | Subchronic treatment with morphine inhibits the hypertension induced by isolation stress in the rat | 223 |
| **J. W. Boja and T. A. Kopajtic** | Ion channel inhibitors may function as potential modulators of cocaine binding | 229 |
| **N. Lukáčová, M. Chavko and G. Halát** | Effect of stobadine on lipid peroxidation and phospholipids in rabbit spinal cord after ischaemia | 235 |
| **M. Tateyama, S. Ohta, T. Nagao, M. Hirobe and H. Ono** | Effect of 4-phenyl-1,2,3,4-tetrahydroisoquinoline on ambulation induced by injection of methamphetamine into the nucleus accumbens in rats | 243 |
| **A. K. Cadogan, C. A. Marsden, I. Tulloch and D. A. Kendall** | Evidence that chronic administration of paroxetine or fluoxetine enhances 5-$HT_2$ receptor function in the brain of the guinea pig | 249 |

| | | |
|---|---|---|
| **Claire Rodger and Barbara J. Pleuvry** | Protective effect of flunarizine and nifedipine alone and in combination with anticonvulsant drugs against PTZ-induced seizures in mice | 257 |
| **B. Gao and M. G. Cutler** | Effects of acute and subchronic administration of ritanserin on the social behaviour of mice | 265 |
| **Susan K. Johnson, H. Fisher and G. C. Wagner** | Partial 6-hydroxydopamine-induced lesions and haloperidol-induced catalepsy | 273 |
| **J. H. Casada and N. Dafny** | Responses of neurons in bed nucleus of the stria terminalis to microiontophoretically applied morphine, norepinephrine and acetylcholine | 279 |
| **R. Lomneth, J. Gimenez, T. F. J. Martin and B. R. DasGupta** | Calcium-dependent release of norepinephrine from permeabilized PC12 cells is inhibited by ~48 and ~112 kDa fragments of botulinum neurotoxin type E | 285 |
| **E. Messamore, N. Ogane and E. Giacobini** | Cholinesterase inhibitor effects on extracellular acetylcholine in rat striatum | 291 |
| **H. R. Weiss and A. K. Sinha** | Imbalance of regional cerebral blood flow and oxygen consumption: effect of vascular alpha adrenoceptor blockade | 297 |
| **C. Wang, M. K. Chakrabarti and J. G. Whitwam** | Synergism between the antinociceptive effects of intrathecal midazolam and fentanyl on both A $\delta$ and C somatosympathetic reflexes | 303 |
| **T. Kano, Y. Katayama, S. Miyazaki, K. Kinoshita, K. Kawamata and T. Tsubokawa** | Effects of indeloxazine on hippocampal CA1 pyramidal cell damage following transient cerebral ischemia in the gerbil | 307 |
| *Rapid Communication* | | |
| **Joanne W. Goh and Melinda A. Musgrave** | L-AP3 does not antagonize hippocampal synaptic depression induced by 1S,3R-ACPD | 311 |
| *Corrigendum* | | 313 |


## NUMBER 4


| | | |
|---|---|---|
| **N. Yoshimura, E. Mizuta, S. Kuno, M. Sasa and O. Yoshida** | The dopamine $D_1$ receptor agonist SKF 38393 suppresses detrusor hyperreflexia in the monkey with parkinsonism induced by 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP) | 315 |
| **Pirkko Paakkari, Ilari Paakkari, Phillip Landes, Anna-Leena Sirén and Giora Feuerstein** | Respiratory $\mu$-opioid and benzodiazepine interactions in the unrestrained rat | 323 |
| **Ashish Singh and Irwin Lucki** | Antidepressant-like activity of compounds with varying efficacy at 5-$HT_{1A}$ receptors | 331 |
| **Kaoru Kobayashi and Osamu Inoue** | An increase in the *in vivo* binding of [$^3$H]SCH 23390 induced by MK-801 in the mouse striatum | 341 |
| **Doreen M. Grech, Joyce Willetts and Robert L. Balster** | Pharmacological specificity of *N*-methyl-D-aspartate discrimination in rats | 349 |
| **Christine Ennis and M. C. W. Minchin** | Modulation of the $GABA_A$-like autoreceptor by barbiturates but not by steroids | 355 |
| **Jenny L. Wiley, Rita L. Barrett, Darrell T. Britt, Robert L. Balster and Billy R. Martin** | Discriminative stimulus effects of $\Delta^9$-tetrahydrocannabinol and $\Delta^{9-11}$-tetrahydrocannabinol in rats and rhesus monkeys | 359 |
| **T. I. Kanui, A. Tjølsen, A. Lund, Norma Mjellem-Joly and K. Hole** | Antinociceptive effects of intrathecal administration of $\alpha$-adrenoceptor antagonists and clonidine in the formalin test in the mouse | 367 |
| **P. C. Molenaar, J. E. Biewenga, G. Th. H. Van Kempen and J. A. De Priester** | Effect of ephedrine on muscle weakness in a model of myasthenia gravis in rats | 373 |

| | | |
|---|---|---|
| **N. Takeuchi, Y. Takikawa and N. Shibuya** | Actions of benzalkonium chloride as a potent depressant at the neuromuscular junction | 377 |
| **A. C. McCreary and C. A. Marsden** | Cocaine-induced behaviour: dopamine $D_1$ receptor antagonism by SCH 23390 prevents expression of conditioned sensitisation following repeated administration of cocaine | 387 |
| **A. Martínez and E. Arilla** | The effect of diazepam and the benzodiazepine antagonist CGS 8216 on the somatostatinergic neuronal system | 393 |
| **O. Carter Snead III and Chun Che Liu** | $GABA_A$ receptor function in the $\gamma$-hydroxybutyrate model of generalized absence seizures | 401 |


## NUMBER 5


| | | |
|---|---|---|
| **Margaret G. Cutler** | Comparison of the effects of yohimbine and clonidine on the behaviour of female mice during social encounters in an "approach-avoidance" situation | 411 |
| **Andre L. Curtis, Eileen Conti and Rita J. Valentino** | Cocaine effects on brain noradrenergic neurons of anesthetized and unanesthetized rats | 419 |
| **B. Gao and M. G. Cutler** | Buspirone increases social investigation in pair-housed male mice; comparison with the effects of chlordiazepoxide | 429 |
| **V. Van Der Meersch-Mougeot, M. Da Rocha Jr, C. Monier, B. Diquet, A. J. Puech and M. H. Thiébot** | Benzodiazepines reverse the anti-immobility effect of antidepressants in the forced swimming test in mice | 439 |
| **Robert Stickgold, Julie Williams, Subimal Datta, James Quattrochi and J. Allan Hobson** | Suppression of eltoprazine-induced REM sleep rebound by scopolamine | 447 |
| **S. M. P. Anderson, R. J. De Souza and A. J. Cross** | The human neuroblastoma cell line, IMR-32 possesses a $GABA_A$ receptor lacking the benzodiazepine modulatory site | 455 |
| **Roy Corbett and Robert W. Dunn** | Effects of 5,7 dichlorokynurenic acid on conflict, social interaction and plus maze behaviors | 461 |
| **Diana A. Jauch, Vimala H. Sethy, Barton G. Weick, Thomas N. Chase and Robert Schwarcz** | Intravenous administration of L-kynurenine to rhesus monkeys: effect on quinolinate and kynurenate levels in serum and cerebrospinal fluid | 467 |
| **M. Nomoto and T. Fukuda** | A selective $MAO_B$ inhibitor Ro19-6327 potentiates the effects of levodopa on parkinsonism induced by MPTP in the common marmoset | 473 |
| **Y. Watanabe, H. Saito and K. Abe** | Tricyclic antidepressants block NMDA receptor-mediated synaptic responses and induction of long-term potentiation in rat hippocampal slices | 479 |
| **K. Yoshida, D. K. Gjerde, M. A. Carino, L. M. Halpern and A. Horita** | The effects of SCH 23390 and raclopride on cocaine-induced analepsis and EEG arousal in rabbits | 487 |
| **W. Kropf and K. Kuschinsky** | Effects of stimulation of dopamine $D_1$ receptors on the cortical EEG in rats: different influences by a blockade of $D_2$ receptors and by an activation of putative dopamine autoreceptors | 493 |
| **D. D. Wheeler, A. M. Edwards and J. G. Ondo** | Dopamine uptake in five structures of the brain: comparison of rate, sodium dependence and sensitivity to cocaine | 501 |
| *Rapid Communications* | | |
| **Siobhan A. Daly and John L. Waddington** | Behavioural effects of the putative D-3 dopamine receptor agonist 7-OH-DPAT in relation to other "D-2-like" agonists | 509 |
| **Nobuo Kato and Hiroshi Yoshimura** | Tetanization during $GABA_A$ receptor activation induces long-term depression in visual cortex slices | 511 |
| *Announcement* | | I |

## NUMBER 6


| | | |
|---|---|---|
| **P. L. Needham, M. J. Skill, A. Cowan, R. J. Redfern and D. J. Heal** | Reserpinization severs the cooperative but not the oppositional interaction between D1 and D2 receptors | 515 |
| **Pamela E. Potter and Shunichi Nitta** | Alterations in modulation of acetylcholine release following lesion of hippocampal cholinergic neurons with the neurotoxin AF64A | 519 |
| **Karen Bohmaker, Arlene S. Eison, Frank D. Yocca and Emanuel Meller** | Comparative effects of chronic 8-OH-DPAT, gepirone and ipsapirone treatment on the sensitivity of somatodendritic 5-$HT_{1A}$ autoreceptors | 527 |
| **Karey Elrod, Kiril Raikoff, Ernst Wulfert and Israel Hanin** | UCB 29120, a novel, potential psychotropic agent, alters norepinephrine and dopamine content of rat brain | 535 |
| **Kenneth Grasing and Hazel Szeto** | EEG changes with different levels of morphine self-administration | 543 |
| **A. Jon Stoessl and Elizabeth Polanski** | Neuroleptic-induced chewing movements in the rat are suppressed by peripherally but not centrally administered CCK and abolished by bilateral subdiaphragmatic vagotomy | 555 |
| **Scott Wieland, Christine T. Fischette and Irwin Lucki** | Effect of chronic treatments with tandospirone and imipramine on serotonin-mediated behavioral responses and monoamine receptors | 561 |
| **Kazuyoshi Tsukamoto and Alan F. Sved** | Contrasting effects of the GABA transaminase inhibitors $\gamma$-vinylGABA and aminooxyacetic acid on arterial pressure following injection into nucleus tractus solitarius | 575 |
| **G. M. Toney and J. P. Porter** | Effects of blockade of AT1 and AT2 receptors in brain on the central angiotensin II pressor response in conscious spontaneously hypertensive rats | 581 |
| **N. Mjellem, A. Lund and K. Hole** | Reduction of NMDA-induced behaviour after acute and chronic administration of desipramine in mice | 591 |
| **K. S. Hsu, W. M. Fu and S. Y. Lin-Shiau** | Studies on the neuromuscular blocking action of MPTP in the mouse phrenic nerve–diaphragm | 597 |
| **M. Poncelet, V. Santucci, R. Paul, C. Gueudet, S. Lavastre, J. Guitard, R. Steinberg, J. P. Terranova, J. C. Brelière, P. Soubrié and G. Le Fur** | Neuropharmacological profile of a novel and selective ligand of the sigma site: SR 31742A | 605 |


## NUMBER 7


| | | |
|---|---|---|
| **A. T. Kennedy, I. Kitchen and R. G. Hill** | Assessment of 8-OH-DPAT induced spontaneous tailflicks as an *in vivo* model of 5-$HT_{1A}$ function in young rats | 617 |
| **H. Zhuo, S. J. Fung and C. D. Barnes** | Opioid action on spinal cord reflexes due to dorsolateral pontine tegmentum stimulation | 621 |
| **S. Bourgoin, M. Pohl, A. Mauborgne, J. J. Benoliel, E. Collin, M. Hamon and F. Cesselin** | Monoaminergic control of the release of calcitonin gene-related peptide- and substance P-like materials from rat spinal cord slices | 633 |
| **Lynda Uphouse, Marjay Caldarola-Pastuszka and Nekayla Moore** | Inhibitory effects of the 5-$HT_{1A}$ agonists, 5-hydroxy- and 5-methoxy-(3-(di-*n*-propylamino)chroman), on female lordosis behavior | 641 |
| **A. H. Young, R. C. Dow, G. M. Goodwin and G. Fink** | The effects of adrenalectomy and ovariectomy on the behavioural and hypothermic responses of rats to 8-hydroxy-2(di-*n*-propylamino)tetralin (8-OH-DPAT) | 653 |
| **Jiankang Liu and Akitane Mori** | Antioxidant and pro-oxidant activities of *p*-hydroxybenzyl alcohol and vanillin: effects on free radicals, brain peroxidation and degradation of benzoate, deoxyribose, amino acids and DNA | 659 |

| | | |
|---|---|---|
| **E. Sybirska, J. P. Seibyl, J. D. Bremner, R. M. Baldwin, M. S. Al-Tikriti, C. Bradberry, R. T. Malison, Y. Zea-Ponce, S. Zoghbi, M. During, A. W. Goddard, S. W. Woods, P. B. Hoffer, D. S. Charney and R. B. Innis** | [$^{123}$I]Iomazenil SPECT imaging demonstrates significant benzodiazepine receptor reserve in human and nonhuman primate brain | 671 |
| **M. Matsumoto, M. Inagaki, Y. Kiuchi, J. Izumi, Y. Yamazaki and K. Oguchi** | Role of calcium ions in dopamine release induced by sodium cyanide perfusion in rat striatum | 681 |
| **S. Sakurada, N. Nakata, T. Sakurada, K. Chaki, S. Kawamura, K. Kisara and K. Suzuki** | Tolerance and cross-tolerance to the antinociceptive effects of [D-Arg$^2$]-dermorphin tetrapeptide analogue and morphine | 689 |
| **M. Yamamoto, M. Ooyama, Y. Ozawa, M. Okada, S. Tada, T. Yamaguchi and H. Endo** | Effects of indeloxazine hydrochloride, a cerebral activator, on passive avoidance learning impaired by disruption of cholinergic transmission in rats | 695 |
| **R. Yu. Yukhananov, Q. Z. Zhai, S. Persson, C. Post and F. Nyberg** | Chronic administration of morphine decreases level of dynorphin A in the rat nucleus accumbens | 703 |
| **H. S. Sharma, F. Nyberg, M. Thörnwall and Y. Olsson** | Met-enkephalin-Arg$^6$-Phe$^7$ in spinal cord and brain following traumatic injury to the spinal cord: influence of *p*-chlorophenylalanine. An experimental study in the rat using radioimmunoassay technique | 711 |
| *Rapid Communications* | | |
| **Nicholas A. Moore, Gaynor Rees, Graham Sanger and Sandy Awere** | Effect of L-type calcium channel modulators on stimulant-induced hyperactivity | 719 |
| **John J. Byrnes, Gary A. Pritchard, Jonathan M. Koff and Lawrence G. Miller** | Prenatal cocaine exposure: decreased sensitization to cocaine and decreased striatal dopamine transporter binding in offspring | 721 |
| **D. E. Jane, P. L. St. J. Jones, P. C.-K. Pook, T. E. Salt, D. C. Sunter and J. C. Watkins** | Stereospecific antagonism by (+)-α-methyl-4-carboxyphenylglycine (MCPG) of (1S,3R)-ACPD-induced effects in neonatal rat motoneurones and rat thalamic neurones | 725 |


## NUMBER 8


| | | |
|---|---|---|
| **Nigel R. Newberry, Clare J. Watkins, Timothy S. Sprosen, Thomas P. Blackburn, David G. Grahame-Smith and Ronald A. Leslie** | BRL 46470 potently antagonizes neural responses activated by 5-HT$_3$ receptors | 729 |
| **S. C. Cheetham, J. A. Viggers, N. A. Slater, D. J. Heal and W. R. Buckett** | [$^3$H]Paroxetine binding in rat frontal cortex strongly correlates with [$^3$H]5-HT uptake: effect of administration of various antidepressant treatments | 737 |
| **Erik Messamore, Ulrika Warpman, Nobuo Ogane and Ezio Giacobini** | Cholinesterase inhibitor effects on extracellular acetylcholine in rat cortex | 745 |
| **Paul J. Brent** | Behavioural effect of pretreatment with opioid antagonists and sigma binding site ligands on the abnormal motor response produced by the kappa opioid agonist U50,488H in guinea pigs | 751 |
| **M. Tateyama, S. Ohta, T. Nagao, M. Hirobe and H. Ono** | Inhibitory effect of 4-phenyltetrahydroisoquinoline on locomotion and dopamine release induced by micro-injection of methamphetamine into the nucleus accumbens of the rat | 761 |
| **N. Zhou, L. G. Hammerland and T. N. Parks** | γ-D-Glutamylaminomethyl sulfonic acid (GAMS) distinguishes kainic acid- from AMPA-induced responses in *Xenopus* oocytes expressing chick brain glutamate receptors | 767 |
| **Nobuyo Kamijo, Taku Nagao and Hideki Ono** | Depression of the monosynaptic reflex by apomorphine or bromocriptine is not mediated by $D_1/D_2$ receptors | 777 |

| | | |
|---|---|---|
| **Z. Kvaltínová, L. Lukovič and S. Štolc** | Effect of incomplete ischemia and reperfusion of the rat brain on the density and affinity of α-adrenergic binding sites in the cerebral cortex. Prevention of changes by stobadine and vitamin E | 785 |
| **A. Mørk and A. Geisler** | Effects of minocycline on accumulation of cyclic AMP in cerebral cortex of rat. A comparison with lithium | 793 |
| **P. L. R. Andrews and P. Bhandari** | Resinferatoxin, an ultrapotent capsaicin analogue, has anti-emetic properties in the ferret | 799 |
| **K. D. Nantwi and E. P. Schoener** | Cocaine and dopaminergic actions in rat neostriatum | 807 |
| **Anita E. Ciarleglio, Margery C. Beinfeld and T. C. Westfall** | Pharmacological characterization of the release of neuropeptide Y-like immunoreactivity from the rat hypothalamus | 819 |
| **E. Toth, E. S. Vizi and A. Lajtha** | Effect of nicotine on levels of extracellular amino acids in regions of the rat brain *in vivo* | 827 |
| *Announcement* | | I |


## NUMBER 9


| | | |
|---|---|---|
| **Yoichi Nakamura, Kiyoshi Kataoka, Michiko Ishida and Haruhiko Shinozaki** | (2*S*,3*S*,4*R*)-2-(Carboxycyclopropyl)glycine, a potent and competitive inhibitor of both glial and neuronal uptake of glutamate | 833 |
| **K. P. Datla and G. Curzon** | Behavioural and neurochemical evidence for the decrease of brain extracellular 5-HT by the antidepressant drug tianeptine | 839 |
| **Richard Loiacono, Jenny Stephenson, Joanne Stevenson and Fred Mitchelson** | Multiple binding sites for nicotine receptor antagonists in inhibiting [$^3$H](−)-nicotine binding in rat cortex | 847 |
| **Ghislaine Perrault, Eliane Morel, David J. Sanger and Branimir Zivkovic** | Repeated treatment with alpidem, a new anxiolytic, does not induce tolerance or physical dependence | 855 |
| **M. Bartoletti, M. Gaiardi, C. Gubellini, A. Bacchi and M. Babbini** | Effects of buprenorphine on motility in chronically morphine treated rats | 865 |
| **Erik H. F. Wong, Douglas W. Bonhaus, Jeffrey A. Lee, Irene Wu, Dana N. Loury and Richard M. Eglen** | Different densities of 5-HT$_3$ receptors are labeled by [$^3$H]quipazine, [$^3$H]GR 65630 and [$^3$H]granisetron | 869 |
| **K. S. Hsu and S. Y. Lin-Shiau** | Potentiation of MPTP by 4-phenylpyridine on the neuromuscular blockade in mouse phrenic nerve–diaphragm | 877 |
| **Shana L. Bowling, James K. Rowlett and Michael T. Bardo** | The effect of environmental enrichment on amphetamine-stimulated locomotor activity, dopamine synthesis and dopamine release | 885 |
| **T. Żarnowski, Z. Kleinrok, W. A. Turski and S. J. Czuczwar** | 2,3-Dihydroxy-6-nitro-7-sulfamoylbenzo(F)quinoxaline enhances the protective activity of common antiepileptic drugs against maximal electroshock-induced seizures in mice | 895 |
| **Paul R. Buckland, Michael C. O'Donovan and Peter McGuffin** | Clozapine and sulpiride up-regulate dopamine D$_3$ receptor mRNA levels | 901 |
| **Alice A. Larson and Xiaofeng Sun** | Regulation of sigma activity by the amino-terminus of substance P in the mouse spinal cord: involvement of phencyclidine (PCP) sites not linked to *N*-methyl-D-aspartate (NMDA) activity | 909 |
| **W. G. Sannita, V. Balestra, G. DiBon, K. M. Hassan and G. Rosadini** | Ammonia-independent modifications of the background EEG signal and paradoxical enhancement of epileptic abnormalities in EEG after acute administration of valproate to epileptic patients | 919 |

*Rapid Communications*
**Gernot Riedel and Klaus Reymann** — An antagonist of the metabotropic glutamate receptor prevents LTP in the dentate gyrus of freely moving rats 929

**Olga A. Sergueeva, Nikolai B. Fedorov and Klaus G. Reymann** — An antagonist of glutamate metabotropic receptors, (RS)-α-methyl-4-carboxyphenylglycine, prevents the LTP-related increase in postsynaptic AMPA sensitivity in hippocampal slices 933

## NUMBER 10

**S. N. Mitchell** — Role of the locus coeruleus in the noradrenergic response to a systemic administration of nicotine 937

**Ichiro Niki and Stephen J. H. Ashcroft** — Characterization and solubilization of the sulphonylurea receptor in rat brain 951

**Hideo Fukui, Masaki Yamamoto, Takao Ando, Satoshi Sasaki and Shuzo Sato** — Increase in serotonin levels in the dog ileum and blood by cisplatin as measured by microdialysis 959

**B. Gao and M. G. Cutler** — Effects of chlordiazepoxide, buspirone and the 5-$HT_3$ receptor antagonist, BRL 46470, on the behaviour of oestrous and dioestrous female mice when encountering male partners 969

**R. Stefański, W. Palejko, A. Bidziński, W. Kostowski and A. Płaźnik** — Serotonergic innervation of the hippocampus and nucleus accumbens septi and the anxiolytic-like action of midazolam and 5-$HT_{1A}$ receptor agonists 977

**R. Stefański, W. Palejko, A. Bidziński, W. Kostowski and A. Płaźnik** — Serotonergic innervation of the hippocampus and nucleus accumbens septi and the anxiolytic-like action of the 5-$HT_3$ receptor antagonists 987

**Ray W. Fuller and Harold D. Snoddy** — Evaluation of nefopam as a monoamine uptake inhibitor *in vivo* in mice 995

**Paul J. Mitchell and Allan Fletcher** — Venlafaxine exhibits pre-clinical antidepressant activity in the resident–intruder social interaction paradigm 1001

**D. N. Stephens and L. Turski** — Kindling to the benzodiazepine receptor inverse agonist, FG 7142: evidence for involvement of NMDA, but not non-NMDA, glutamatergic receptors 1011

**Makoto Ukai, Tohru Toyoshi and Tsutomu Kameyama** — DAMGO ([D-Ala$^2$,*N*MePhe$^4$,Gly-ol]enkephalin), but not DPLPE ([D-Pen$^2$,L-Pen$^5$]enkephalin), specifically inhibits methamphetamine-induced behavioral responses in the mouse 1019

**Lillian J. Robichaud and Peter A. Boxer** — Polyamine modulation of excitatory amino acid responses in the rat cortical wedge 1025

**Kjell Svensson, Elias Eriksson and Arvid Carlsson** — Partial dopamine receptor agonists reverse behavioral, biochemical and neuroendocrine effects of neuroleptics in the rat: potential treatment of extrapyramidal side effects 1037

**Valerie L. Woodburn, Neil J. Hayward, Judith A. Poat, Geoffrey N. Woodruff and John Hughes** — The effect of dizocilpine and enadoline on immediate early gene expression in the gerbil global ischaemia model 1047

**Thomas V. Dunwiddie and Karen K. Miller** — Effects of adenosine and cadmium on presynaptic fiber spikes in the CA1 region of rat hippocampus *in vitro* 1061

*Rapid Communications*
**Yossef Itzhak** — Nitric oxide (NO) synthase inhibitors abolish cocaine-induced toxicity in mice 1069

**C. H. Davies, M. F. Pozza and G. L. Collingridge** — CGP 55845A: a potent antagonist of $GABA_B$ receptors in the CA1 region of rat hippocampus 1071

## NUMBER 11

*Editorial* iii

*Announcement* iv

| | | |
|---|---|---|
| **J.-F. Zhang, A. D. Randall, P. T. Ellinor, W. A. Horne, W. A. Sather, T. Tanabe, T. L. Schwarz and R. W. Tsien** | Distinctive pharmacology and kinetics of cloned neuronal $Ca^{2+}$ channels and their possible counterparts in mammalian CNS neurons | 1075 |
| **Paul F. Brust, Susan Simerson, Ann F. McCue, Charles R. Deal, Susan Schoonmaker, Mark E. Williams, Gönül Veliçelebi, Edwin C. Johnson, Michael M. Harpold and Steven B. Ellis** | Human neuronal voltage-dependent calcium channels: studies on subunit structure and role in channel assembly | 1089 |
| **Anthony Stea, Stefan J. Dubel, Marlon Pragnell, John P. Leonard, Kevin P. Campbell and Terry P. Snutch** | A $\beta$-subunit normalizes the electrophysiological properties of a cloned N-type $Ca^{2+}$ channel $\alpha_1$-subunit | 1103 |
| **W. Jeffrey Tomlinson, Anthony Stea, Emmanuel Bourinet, Pierre Charnet, Joel Nargeot and Terry P. Snutch** | Functional properties of a neuronal class C L-type calcium channel | 1117 |
| **Derrick R. Witcher, Michel De Waard and Kevin P. Campbell** | Characterization of the purified N-type $Ca^{2+}$ channel and the cation sensitivity of $\omega$-conotoxin GVIA binding | 1127 |
| **Virginia D. Monje, Julie A. Haack, Scott R. Naisbitt, George Miljanich, J. Ramachandran, Laszlo Nasdasdi, Baldomero M. Olivera, David R. Hillyard and William R. Gray** | A new *Conus* peptide ligand for Ca channel subtypes | 1141 |
| **Julie A. Haack, Phillip Kinser, Doju Yoshikami and Baldomero M. Olivera** | Biotinylated derivatives of $\omega$-conotoxins GVIA and MVIID: probes for neuronal calcium channels | 1151 |
| **Isabelle M. Mintz and Bruce P. Bean** | Block of calcium channels in rat neurons by synthetic $\omega$-Aga-IVA | 1161 |
| **Hugh A. Pearson, Kathy G. Sutton, Roderick H. Scott and Annette C. Dolphin** | $Ca^{2+}$ currents in cerebellar granule neurones: role of internal $Mg^{2+}$ in altering characteristics and antagonist effects | 1171 |
| **J. M. Pocock, M. A. Cousin and D. G. Nicholls** | The calcium channel coupled to the exocytosis of L-glutamate from cerebellar granule cells is inhibited by the spider toxin, Aga-GI | 1185 |
| **David Bowman, Samantha Alexander and David Lodge** | Pharmacological characterisation of the calcium channels coupled to the plateau phase of KCl-induced intracellular free $Ca^{2+}$ elevation in chicken and rat synaptosomes | 1195 |
| **Shinichi Kawajiri and Raymond Dingledine** | Multiple structural determinants of voltage-dependent magnesium block in recombinant NMDA receptors | 1203 |
| **Vytautas P. Bindokas, James R. Brorson and Richard J. Miller** | Characteristics of voltage sensitive calcium channels in dendrites of cultured rat cerebellar neurons | 1213 |
| **R. Schneggenburger, F. Tempia and A. Konnerth** | Glutamate- and AMPA-mediated calcium influx through glutamate receptor channels in medial septal neurons | 1221 |
| **B. G. Frenguelli, B. Potier, N. T. Slater, S. Alford and G. L. Collingridge** | Metabotropic glutamate receptors and calcium signalling in dendrites of hippocampal CA1 neurones | 1229 |
| **David J. Rossi and N. Traverse Slater** | The developmental onset of NMDA receptor-channel activity during neuronal migration | 1239 |
| **C. D. Benham, T. H. Brown, D. G. Cooper, M. L. Evans, M. H. Harries, H. J. Herdon, J. E. Meakin, K. L. Murkitt, S. R. Patel, J. C. Roberts, A. L. Rothaul, S. J. Smith, N. Wood and A. J. Hunter** | SB 201823-A, a neuronal $Ca^{2+}$ antagonist is neuroprotective in two models of cerebral ischaemia | 1249 |

| | | |
|---|---|---|
| **Mireille Lafon-Cazal, Marcel Culcasi, Florence Gaven, Sylvia Pietri and Joël Bockaert** | Nitric oxide, superoxide and peroxynitrite: putative mediators of NMDA-induced cell death in cerebellar granule cells | 1259 |
| **Eric Southam and John Garthwaite** | The nitric oxide–cyclic GMP signalling pathway in rat brain | 1267 |
| **Steven M. Rothman, Kelvin A. Yamada and Nancy Lancaster** | Nordihydroguaiaretic acid attenuates NMDA neurotoxicity—action beyond the receptor | 1279 |


## NUMBER 12


| | | |
|---|---|---|
| **Jeffery D. Steketee** | Injection of the protein kinase inhibitor H7 into the A10 dopamine region blocks the acute responses to cocaine: behavioral and *in vivo* microdialysis studies | 1289 |
| **Alan A. Baumeister, Mark Hurry, Will Curtis, Tiffany M. Chaney, Eddie Wolf and Ricky R. Leoni** | The antinociceptive and motivational effects of intranigral injection of opioid agonists | 1299 |
| **Patricia I. Johnson, J. R. Stellar and A. David Paul** | Regional reward differences within the ventral pallidum are revealed by microinjections of a mu opiate receptor agonist | 1305 |
| **Masahiko Funada, Tsutomu Suzuki, Minoru Narita, Miwa Misawa and Hiroshi Nagase** | Blockade of morphine reward through the activation of $\kappa$-opioid receptors in mice | 1315 |
| **Kate E. Bufton, Lucinda J. Steward, Peter C. Barber and Nicholas M. Barnes** | Distribution and characterization of the [$^3$H]granisetron-labelled 5-HT$_3$ receptor in the human forebrain | 1325 |
| **Cathy Fernandes and Sandra E. File** | Beware the builders: construction noise changes [$^{14}$C]GABA release and uptake from amygdaloid and hippocampal slices in the rat | 1333 |
| **Chris G. Parsons, René Gruner, Jouri Rozental, John Millar and David Lodge** | Patch clamp studies on the kinetics and selectivity of *N*-methyl-D-aspartate receptor antagonism by memantine (1-amino-3,5-dimethyladamantan) | 1337 |
| **Graham J. Birrell, Mary P. Gordon and Frank W. Marcoux** | (1S,3R)-1-aminocyclopentane-1,3-dicarboxylic acid attenuates *N*-methyl-D-aspartate-induced neuronal cell death in cortical cultures via a reduction in delayed $Ca^{2+}$ accumulation | 1351 |
| **Darryle D. Schoepp and Bryan G. Johnson** | Metabotropic glutamate receptor modulation of cAMP accumulation in the neonatal rat hippocampus | 1359 |
| **Avelina Tortosa, Rosa Rivera, Santiago Ambrosio, Ramon Bartrons and Isidro Ferrer** | Fructose-1,6-bisphosphate fails to ameliorate delayed neuronal death in the CA1 area after transient forebrain ischaemia in gerbils | 1367 |
| **J. P. Fawcett, P. P. M. Patel and D. B. Menkes** | Antidepressant treatment and chemical sympathectomy fail to modulate $\alpha_1$-adrenoceptor sensitivity in mouse eye | 1373 |
| **M. H. Baumann, J. J. Rutter and S. B. Auerbach** | Intravenous administration of the serotonin agonist *m*-chlorophenylpiperazine (mCPP) increases extracellular serotonin in the diencephalon of awake rats | 1381 |
| **L. N. Holland, L. C. Shuster and J. J. Buccafusco** | Role of spinal and supraspinal muscarinic receptors in the expression of morphine withdrawal symptoms in the rat | 1387 |
| **Edmund Przegaliński, Boguslawa Budziszewska, Joanna Siwanowicz and Lucylla Jaworska** | The effect of repeated combined treatment with nifedipine and antidepressant drugs or electroconvulsive shock on the hippocampal corticosteroid receptors in rats | 1397 |
| **C. A. Ayala and E. H. Jaffe** | Pharmacological modulation of endogenous dopamine and DOPAC outflow from nucleus accumbens | 1401 |
| **Minna M. Hämäläinen and Antti Pertovaara** | The rostroventromedial medulla is not involved in $\alpha_2$-adrenoceptor-mediated antinociception in the rat | 1411 |

| | | |
|---|---|---|
| **Steven R. Glaum, David C. Sunter, Peter M. Udvarhelyi, Jeffrey C. Watkins and Richard J. Miller** | The actions of phenylglycine derived metabotropic glutamate receptor antagonists on multiple (1S,3R)-ACPD responses in the rat nucleus of the tractus solitarius | 1419 |
| **A. A. Alhaider, A. M. Ageel and O. T. Ginawi** | The quipazine- and TFMPP-increased conditioned avoidance response in rats: role of 5-$HT_{1C}$/5-$HT_2$ receptors | 1427 |
| **Laurel B. Deloria and G. J. Mannering** | Interferon induces sleep and other CNS responses in mice recovering from hexobarbital anesthesia | 1433 |
| *Rapid Communications* | | |
| **J. F. Blake, C. Q. Cao, P. M. Headley, G. L. Collingridge, F. Brugger and R. H. Evans** | Antagonism of baclofen-induced depression of whole-cell synaptic currents in spinal dorsal horn neurones by the potent $GABA_B$ antagonist CGP55845 | 1437 |
| **Masayuki Sasaki, Hans W. Müller-Gärtner, John R. Lever, Hayden T. Ravert, Robert F. Dannals, Tomas R. Guilarte and Henry N. Wagner Jr** | Assessment of brain muscarinic acetylcholinergic receptors in living mice using a simple probe, [$^{125}$I]-4-iododexetimide and [$^{125}$I]-4-iodolevetimide | 1441 |
| *Announcements* | | I |

RG